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UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SINGULAR COMPUTING LLC,)	
)	
Plaintiff)	Civil Action
)	
)	No. 19-12551-FDS
vs.)	
)	
GOOGLE LLC,)	
Defendant)	

BEFORE: CHIEF JUDGE F. DENNIS SAYLOR, IV

MOTION HEARING

John Joseph Moakley United States Courthouse
1 Courthouse Way
Boston, MA 02210

June 28, 2023
9:00 a.m.

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1 I don't want to put artificial limits on you, except I want to
2 divide the time roughly equally, so let's call it 55 minutes
3 apiece, and I'll let you emphasize what you want to emphasize.

4 I don't know if you've talked about what makes sense
5 in going first, it probably makes sense to begin with Google's
6 motion to continue the trial and then do the summary judgment
7 motions and then the Daubert motions, but, Mr. Van Nest, does
8 that work for you?

9 MR. VAN NEST: That's fine, your Honor.

09:01AM 10 THE COURT: All right. Why don't we do that. Don't
11 be afraid or worried about talking down to me but treating me
12 like a kindergartner, I will appreciate that very much. Don't
13 assume I know anything, and the point of this is to summarize
14 and to hit the high points of things that you think I really
15 ought to focus on and you really care about. Obviously, I have
16 a stack of material. Some of this is quite technical, but the
17 floor is yours. Mr. Van Nest.

18 MR. VAN NEST: Thank you, your Honor. If I may, could
19 I start with our non-infringement motion? I don't have
09:01AM 20 anything to add to the motion to continue other than --

21 THE COURT: That's fine.

22 MR. VAN NEST: -- what I nix in the papers. So this
23 is the motion for summary judgment of non-infringement on
24 behalf of Google, and before I get into the slides, just by way
25 of introduction, your Honor, Singular alleges that Google's

1 Tensor Processing Units, or TPUs, infringe the two remaining
2 claims in the case. Those claims, which are Claim 53 of the
3 '273 patent and Claim 7 of the '156 are both device claims, and
4 our motion is based on a purely structural limitation present
5 in both claims.

6 The claims both require that the number of
7 low-precision, high-dynamic range execution units in the
8 product exceed by at least 100 the number of 32-bit processing
9 units.

09:02AM 10 Now, the Court has construed the term, "low-precision,
11 high-dynamic range execution unit" to mean "a processing
12 element comprising an arithmetic circuit paired with a memory
13 circuit." And you observed in your order that the
14 specification teaches that the processing element is a tangible
15 object, hardware, in other words.

16 Now, there's no dispute between the parties about
17 what's necessary to satisfy the claims. The parties both agree
18 that each TPU contains 8200 circuits capable of performing
19 operations on 32-bit inputs, therefore, there must be at least
09:03AM 20 8300, 100 more, low-precision execution units to satisfy this
21 limitation.

22 The accused TPUs simply don't meet this requirement,
23 your Honor, based on the physical structure of the chips.
24 There's no dispute there that needs to be submitted to the jury
25 because the parties agree on what the structure is.

1 According to the opinion of their expert and the
2 undisputed facts they stipulated to, there only exists no more
3 than 1,000 such units in the TPUv2 and roughly 2,000 units in
4 the TPUv3, far fewer than the claims require.

5 I have some slides, your Honor, which we're going to
6 display. I can also hand out a set to your Honor and your
7 clerks.

8 THE COURT: All right.

9 MR. VAN NEST: So let's begin. This is a literal
09:04AM 10 infringement claim. Let's go to our first slide. So to
11 establish literal limitation, as your Honor knows, every
12 limitation must be found in the accused product exactly, and
13 what we're talking, as we are here, about an apparatus claim,
14 the device must meet all structural limitations, and we're
15 focusing on one that is present in both of the claims.

16 And as your Honor is aware, on our next slide, the
17 burden of establishing infringement is on the plaintiff, and so
18 if they can't put forth evidence to support a finding that one
19 of the limitations is met, that's it, non-infringement is out
09:05AM 20 and summary judgment is appropriate.

21 Here's the claim language. This is the relevant.
22 I've added the A and the B to simplify it a little bit, so this
23 is, wherein the number of A, that's the low-precision units in
24 the device, exceeds by one hundred the nonnegative integer
25 number, that's just setting a minimum, of B, execution units,

1 adapted to execute at least the operation of multiplication on
2 floating point numbers at 32 points, 32 bits wide, so that's
3 more full precision.

4 Now, your Honor -- let's go to the next slide. Your
5 Honor has construed this to be hardware. There was a debate
6 about this at the Markman. Your Honor accepted the plaintiff's
7 instruction, which is what this is, a low-precision,
8 high-dynamic range execution unit is a processing element
9 comprising an arithmetic circuit paired with a memory circuit.

09:06AM 10 That's what plaintiffs requested, and they urged the
11 Court to find that this was physical hardware, and you did, the
12 specification uses the term, "processing element," as though it
13 were a tangible object, and the specification teaches that the
14 processing element is a tangible object that comprises
15 arithmetic and memory circuits.

16 Now, this is not any limitation, your Honor, it's an
17 important one, as this next slide shows, because since the
18 Patent Office found that low-precision, high dynamic range
19 units were known, this limitation is the one that Singular is
09:07AM 20 pressing as the main inventive feature in their structure, so
21 you can see these are excerpts from the briefing.

22 They refer to it as a specific structural limitation
23 and very specific limitation. The bottom quote pertains
24 directly to the limitation that we're talking about right now.

25 Now, there is no dispute between the parties about

1 what's required to meet this limitation.

2 Next slide, please. Dr. Khatri reports that there are
3 8200 execution units in each device capable of 32-bit
4 multiplication, so that's our base line. That's the base line.
5 According to the claims, you have to have at least one hundred
6 more than that, and Singular agrees with that as well, in order
7 to meet the exceeds by at least one hundred requirement, an
8 accused TPU board needs to include at least 8300 low-precision,
9 high-dynamic range execution units.

09:08AM 10 Now, in his effort to establish infringement, I'm
11 showing you a picture there, your Honor. We've blacked it out
12 on the public screen. This is Dr. Khatri's attempt to read the
13 claim on Google's TPUs, and as you can see there, he's created
14 a drawing. This was in his deposition. I think it's in his
15 report. The above figure shows the components of a
16 low-precision, high-dynamic range execution unit. They include
17 the precision reducer circuits, those are the box labeled R,
18 and you can see, your Honor, there are two of those, a memory.

19 THE COURT: And, I'm sorry, what are the boxes on the
09:09AM 20 left?

21 MR. VAN NEST: They're providing simply inputs.

22 THE COURT: Okay.

23 MR. VAN NEST: Data coming in, and these are rounding
24 circuits that are rounding down --

25 THE COURT: Okay.

1 MR. VAN NEST: -- from 32 to 16. The GMR is the
2 memory, and one multiplication circuit that's indicated by the
3 X on the right.

4 So according to Dr. Khatri, in order to have an
5 arithmetic circuit, you need two rounding circuits and a
6 multiplication unit. That's what's shown here. And in their
7 brief, they refer to this as a specific physical hardware in
8 each unit, a specific physical hardware in each unit. That's
9 what he has defined.

09:10AM 10 Now, I will say that this is his diagram. There's no
11 circuit that looks exactly like this, but we'll accept it for
12 the purpose of today. As your Honor knows, we've mentioned
13 before there are different components in the chip, but this is
14 his attempt to read it on the TPUs.

15 Unfortunately for him -- oh, go to the next slide.
16 It's also stipulated in connection with this motion as to how
17 many rounding circuits there are in each product. In the
18 TPUv2, there are only 2,048 rounding circuits all in. That's
19 how many exist on the chip.

09:10AM 20 In the TPUv3, there's more than that, 4,096, basically
21 twice as many, but the parties are in agreement that that's all
22 there is on these two products. That's the limit, that's the
23 total of the rounding circuits on the TPUv2 and the TPUv3.

24 Therefore -- let's go to our next slide -- since each
25 unit requires two rounding circuits to establish the arithmetic

1 circuit that's necessary in the processing element, the TPUv3
2 cannot have any more than 1,000 purported low-precision,
3 high-dynamic range execution units.

4 Now, I'll pause here and say, your Honor, we don't
5 agree that there are any such units because the Google products
6 perform exact precise math, but we'll accept his representation
7 for the purpose of this motion. That's for another day, if we
8 get there.

9 And in the TPUv3, just doing the math, and looking
09:12AM 10 again at the hardware, there can only be 2,048 low-precision,
11 high-dynamic range execution units according to Dr. Khatri in
12 the TPUv3, not enough to hit the 8300 minimum required number
13 present in both of these claims. None of the responses by
14 Singular change this, your Honor, because the physical
15 structure of the chip is, as I indicated. There's no debate
16 about that.

17 Dr. Khatri is claiming that because the chips perform
18 a certain number of operations, that's enough, but that's not
19 the case under clear Federal Circuit law. This is not a method
09:12AM 20 claim, it's an apparatus claim. In an apparatus claim,
21 infringement is determined not by what the structure does but
22 what the structure is, what are the components in the
23 structure.

24 We cited the *Hewlett-Packard* case and the *Edgewell*
25 case, and I think Singular essentially agrees with that because

1 they've more or less abandoned abandoned that in their
2 opposition. That's the theory that he posited in his report
3 and in his deposition, but that theory clearly doesn't work
4 under Federal Circuit law.

5 Now, their newfound theory, the so-called, "unique
6 pairs theory -- " let's go to the next slide. This is
7 redacted, but you see the image on the page there, your Honor.
8 This theory was not disclosed in his reports, it was not
9 disclosed in his contentions, but it fails no better. The only
09:13AM 10 way for him to try to reach this 8300 minimum required circuit
11 structure is to not only double count rounding circuits but
12 count each one 128 times. That's absolutely clear from the
13 argument.

14 Take a look at what's on the page there, your Honor.
15 This wasn't even in Dr. Khatri's report. He's borrowed it from
16 Dr. Walker. You see at the bottom there, there are three pairs
17 of circuits. Those are the rounding circuits, the so-called
18 precision-reducing circuits. There are three pairs.

19 Above that in the grid, you see nine multiplication
09:14AM 20 units, MXUs. And those three pairs are sending multiple
21 signals, inputs to those nine.

22 Now, Singular wants to count this as nine circuits,
23 but it's not. It's at most three circuits because there are
24 only three pairs of rounding circuits depicted here.
25 Obviously, the chip has many more, but they all fall into this

1 sort of diagram. They are wanting to count over and over and
2 over 128 times the same rounding circuits in order to meet the
3 requirement, but that flies in the face of the claim itself,
4 which requires a minimum number of units. It flies in the face
5 of your Honor's claim construction, which doesn't talk about
6 emulating a circuit or virtual circuits, it's talking about
7 hardware circuits, arithmetic circuits paired with a memory
8 circuit, and these are units.

9 We know it's hardware because we argued about that at
09:15AM 10 the Markman, and so the only way that Dr. Khatri can get there
11 is by imagining that one circuit with two rounding circuits and
12 an MXU is, in fact, 128 because of the way it operates. That's
13 just not the way the law operates. That's not the way your
14 claim construction was written. That's not the way the
15 requirement is written, it's a structural requirement, not a
16 method claim, and based on that, your Honor, summary judgment
17 is appropriate.

18 There's not a question here to be submitted to the
19 jury, given your Honor's claim construction, the clear language
09:16AM 20 of the claim itself, and the parties' agreement as to what the
21 structure of the TPUs is. There's no dispute. Dr. Khatri is
22 not claiming that there are 16,000 circuits here because he
23 knows there are only 2,000 rounding circuits in the TPUv2 and
24 4,000 in the TPUv3.

25 He's saying because this device creates a hundred,

1 whatever 16,000 outputs in a clock cycle, that meets the claim.
2 It doesn't. You can't -- if you have a coffee maker that can
3 make five cups of coffee in a minute, so be it, it's only one
4 coffee maker.

5 The fact that these rounding circuits may send more
6 than one signal doesn't matter. The claim requires a
7 particular structure, a minimum number of elements, and they
8 can't meet the claim based on what's indisputably there in the
9 TPUs.

09:17AM 10 THE COURT: All right. Let me hear, who is going to
11 take the lead for Singular?

12 MR. SEEVE: I am, your Honor. Good morning. So I'd
13 like to begin just with the assertion that there's no dispute
14 of material fact here. There very much is a dispute of
15 material fact, and so we have printed copies of the slides.
16 Much of them are confidential, and we didn't redact them, so I
17 don't think they're going to appear on the screen, but you
18 should see them, the packet with just two or three slides.

19 THE COURT: I think I have a paper copy.

09:18AM 20 MR. SEEVE: Okay, great. So in the first slide that's
21 not the title slide, you can see what the factual dispute here
22 is. You have Singular's position as set forth by Dr. Khatri,
23 Singular's expert, which says there are 131,000 LPR execution
24 units in one of the accused products, and in the other accused
25 product, there are 262,000 of these things. Google's position,

1 by contrast, and this is a quote from Google's expert,
2 Dr. Walker, he said that there are 1,000 LPDHR execution units
3 in the first accused product and 2,000 in the second.

4 Now, that's not only a dispute of fact, that's a huge
5 difference between the opinions of Google's experts and
6 Singular's experts, and it's material to the question because,
7 as Mr. Van Nest explained, this is about the exceeds
8 limitation, and the question is how many of these LPHDR units
9 are there, and that very fact is clearly in dispute.

09:19AM 10 Now, Google didn't include this fact in its steepened
11 supposedly undisputed facts in the hope that no one would
12 notice, but Singular in its reply to Google stated in its
13 undisputed facts it did include these two facts that you see
14 here as disputing.

15 And in Google's reply, it made no response whatsoever
16 to those facts. It didn't dispute them, it didn't not dispute
17 it, it merely referred generally to these facts as immaterial,
18 right, but they couldn't be more material.

19 Now, Google also admits that it didn't cite in its
09:20AM 20 entire motion for summary judgment or its reply the testimony
21 of its expert, Dr. Walker. It said that this testimony was
22 irrelevant to the question, it's only about the testimony of
23 Dr. Khatri. Well, that makes their entire argument attorney
24 argument.

25 Here, we have Dr. Khatri explaining why there are

1 hundreds of thousands of these things in the accused products.
2 On the other hand, we have Google with no expert support
3 whatsoever asserting that there's only a thousand or two
4 thousand. That's clearly a dispute of material fact, it's
5 something that should go to the jury, and that alone should end
6 the inquiry here about whether Dr. Khatri's testimony gives
7 rise to summary judgment for non-infringement.

8 Now, the second point Mr. Van Nest made was about this
9 conflation of a method claim with a system claim. He said that
09:21AM 10 Dr. Khatri's infringement argument relates to operations per
11 cycle, and that's improper because it's a device claim, it's a
12 tangible thing, et cetera.

13 Dr. Khatri's opinions are perfectly consistent with
14 the fact that this claim, the asserted claims in this case, are
15 device claims, Singular explaining very detailed why that's the
16 case in its opposition, and Google offered no response.

17 I'll explain now the idea here, your Honor, is that
18 the number of operations per cycle that a device can perform is
19 evidence of how many units are in that device. Think about it
09:21AM 20 like a violin. If you have a violin and you hear that violin
21 play a single note, well then, you only know that that violin
22 has at least one string. Maybe it has more, but you only know
23 that it has one string. If you hear that same violin play two
24 notes at the same time, suddenly you know that violin must have
25 at least two strings. There's no other way a violin could play

1 two notes at the same time.

2 Similarly, with Dr. Khatri's argument, Dr. Khatri is
3 saying this device does 16,384 low-precision operations at the
4 same time. Just like the violin, that means it must contain at
5 least 16,384 execution units.

6 Dr. Khatri is not saying it infringes because of the
7 operations that it performs, Dr. Khatri is saying that the
8 operations it performs are evidence of the structure that's
9 necessary, and I think Mr. Van Nest showed a slide. I can't
09:22AM 10 remember which number it was, but that actually shows the
11 structure that Dr. Khatri pointed to that corresponds to this
12 low-precision, high-dynamic range execution unit.

13 No one is denying it's a physical structure.
14 Dr. Khatri was very clear on this at all times, so this idea
15 that Dr. Khatri's testimony should be excluded or there should
16 be a summary judgment in this case because of the conflation of
17 method claims with system claims is simply false.

18 So that, I think, goes to the second point that
19 Mr. Van Nest raised. As for the third point, the question of
09:23AM 20 whether the claims limitations are purely structural versus
21 functional, Google started out by saying the claim is a purely
22 structural claim, Dr. Khatri talking about operations is
23 irrelevant to the question of infringement, and in our
24 opposition, we point out that, yes, it's a device claim, but
25 that device has to do something, and, in particular, it has to

1 do with this low-precision operation.

2 The claim is very specific as to what that operation
3 implies, so the idea that Dr. Khatri talked about operations in
4 his infringement report makes it irrelevant, that is simply not
5 true. The claim requires operations. Dr. Khatri needed to
6 talk about those in proving infringement.

7 And, finally, I'll deal with this question, I believe
8 it was the last issue that was raised of the question of
9 whether there's some new argument in Dr. Khatri's report,
09:24AM 10 whether Singular is shifting arguments from an operations per
11 cycle argument to a unique pairs argument.

12 First of all, this Court held correctly just a few
13 weeks ago that Dr. Khatri's infringement opinions are not new.
14 These are not new, they're not new things that Dr. Khatri came
15 up with, they were disclosed during fact discovery. They were
16 clearly disclosed in Dr. Khatri's report, so this isn't a new
17 thing at all.

18 Singular's arguments have remained the same
19 throughout, and those arguments rest on this idea that rounders
09:24AM 20 can be shared. You've got two rounders that supply inputs to a
21 multiplier, but one of those rounders also supplies inputs to
22 another multiplier. That doesn't mean that it's not two LPHDR
23 execution units.

24 Google never contends or offers any expert testimony
25 or any claim construction whatsoever by the Court, doesn't

1 point to anything in the Court's Markman order that contradicts
2 this basic principle, and, indeed, the patent specification
3 specifically talks about how circuitry can be shared.

4 So the structure of the accused products, we also have
5 a slide showing that actually it's the last slide, it's the
6 same figure that Mr. Van Nest showed. He said, oh, it's very
7 clear, he said that there are three circuits in this diagram.
8 Well, that might be clear to Mr. Van Nest, but to me, it looks
9 like there are nine circuits. In the diagram, you see that
09:25AM 10 grid with nine circuits. There's six rounders at the bottom.
11 They're little colored squares, but as you can see in the
12 diagram, and this is Google's own diagram, in the above grid,
13 each of those rounders is arranged in a unique set of pairs.

14 You've got those nine colored pairs of rounders in the
15 above grid, and each one of them is unique, so, yes, the units
16 that Dr. Kahtri points to are physically distinct. None of
17 them contains the exact same circuitry.

18 We can get more into the technical details of the
19 argument, if your Honor has questions about it, but I think the
09:26AM 20 fact that there's a clear dispute of fact should short-circuit
21 that whole discussion.

22 THE COURT: Let me, I think an analogy would help me
23 understand the two positions, and this may not work, so let me
24 toss this out and get your reaction. Let's picture a subset of
25 the island of Manhattan. You want to go from Penn Station to

1 Grand Central, and let's say hypothetically we'll call it
2 12 by 12, 12 streets, 12 avenues. It's a grid. The structure
3 of that part of Manhattan has 24 things, 12 streets, 12
4 avenues. I don't know how many thousand different ways you
5 could do that walk or whatever the right number is, but the
6 physical structure is this grid and the function is you can
7 walk in different ways and whatever that number is, the
8 different possibilities.

9 Are you saying that the right number, I mean, this is
09:27AM 10 a device, right? I think Google is saying, no, there's only 24
11 because that's a physical structure, and you're saying no, it's
12 I'll pick a number, I don't know what the right number is, one
13 thousand ways that you can do that walk, including two people
14 could do that walk without encountering one another.

15 MR. SEEVE: I liked that analogy, your Honor, but I
16 would make a slightly different analogy about that same set of
17 grid of streets. So there's 12 avenues and 12 cross streets,
18 and Google is saying that means there are 24 -- sorry, a total
19 of 12 street corners, right? A street corner requires an
09:28AM 20 avenue, it requires a cross street, you know, 42nd and 5th,
21 that's a street corner, right? So if you have 12 avenues and
22 you have 12 cross streets and each corner requires a pair, you
23 have 144 street corners, and those are physical things. You
24 can go to the corner of Third Avenue and 212th Street. You can
25 go to that corner, that's a thing, and Google is saying, no,

1 you've got 10 avenues, you've got 10 cross streets, you've only
2 got 12 street corners, and that totally ignores the remaining
3 90 street corners that clearly exist in New York. It makes
4 New York a lot more smaller than it is.

5 Singular's argument recognizes that you compare an
6 avenue, Fifth Avenue with multiple cross streets. It's not
7 counting it twice because it corresponds to a whole bunch of
8 different, physically different tangible street corners, and
9 just like that, we're arguing that this rounder grid, it's the
09:28AM 10 third slide in our slide.

11 You see that grid. It's very much like the streets of
12 New York, and you see there's one round set of rounders that it
13 sort of feeds the cross streets. There's one set of rounders
14 that feeds the avenues, and together you can look at the
15 physical structure -- and that diagram is physical -- of those
16 units, and you can count that there are nine of them, nine
17 physical things.

18 So that I think is a -- if we're making an analogy to
19 street corners, I think that analogy is the one that Singular
09:29AM 20 would go with.

21 THE COURT: Okay. Mr. Van Nest, your response?

22 MR. VAN NEST: I think you hit the nail on the head,
23 your Honor, with your analogy, that is the debate. Under
24 Dr. Khatri's theory, you have to have two avenues, right, two
25 rounding units. There are only a certain number of streets and

1 avenues. That's the structure. This is a structural claim.

2 I'm talking now about the limitation that we're
3 focused on, the exceeds limitation is a structural limitation,
4 and we all agree on that, and the claim itself is an apparatus
5 claim. Your Honor's claim construction makes very clear we're
6 talking about hardware here.

7 Can I have slide 9 from our deck, please. Nothing I
8 heard changes what I said at the beginning. This is not a
9 dispute about facts. Dr. Khatri's got an argument, but it's
09:30AM 10 just an argument, and it's improper based on the claim
11 requirement, based on your Honor's claim construction, and
12 based on common sense.

13 They've agreed that there are only 2,048 rounding
14 circuits on the board. That's the avenues of Manhattan, the
15 lower side. They've agreed on that, and they've also agreed
16 that on the TPUv3, there's only 4,000 and unique, too, for each
17 arithmetic circuit.

18 So they've confirmed what I said at the beginning that
19 they are double counting, triple counting, 128 times counting
09:31AM 20 the operation in order to try to meet a structural limitation,
21 and that's simply improper under Federal Circuit law.

22 There's no dispute about the avenues and the street
23 corners. They're saying that because you can walk it any
24 number of different ways, therefore, there must be more. Well,
25 there aren't more. Just like the violin, there are five

1 strings, six strings. It may play hundreds of notes, but
2 there's only six strings and one violin. That's the point that
3 I'm trying to make.

4 Now, we had a debate at the Markman about how to
5 define these low-precision, high-dynamic range units, and we
6 talked about whether they could be virtual, they could be
7 software, they could be anything else. No. What was decided
8 based on what the plaintiff wanted was a clearly structural
9 hardware construction, and that's what we have.

09:32AM 10 You have to have an arithmetic circuit paired with a
11 memory, and according to Dr. Khatri, the only way that he can
12 read this on the TPUs is by saying that arithmetic circuit
13 requires two rounding circuits and a multiplication circuit.

14 That is immutable. That's his theory, and they've now
15 confirmed that the only way they can even argue, and it is just
16 an argument, not a dispute of fact, is by saying that because
17 we perform multiple operations with that circuitry, therefore,
18 there must be more. There aren't more. There aren't more.
19 They can't create more on the device, and they've stipulated to
09:32AM 20 what's there, so that's why I say summary judgment is
21 appropriate, your Honor.

22 There's no question for the jury to decide here based
23 on a claim construction, the limitation itself, the agreed upon
24 structure of the device. They simply cannot meet this
25 limitation, and it's a required limitation in both of the

1 remaining two claims before the Court.

2 If you have any further questions, your Honor, I'm
3 happy to answer them, but I think you have clearly in mind the
4 dispute.

5 THE COURT: All right. Mr. Seeve, last quick word on
6 this topic.

7 MR. SEEVE: I mean, I think I've largely said my
8 piece, your Honor, except I'd just like to reiterate we're not
9 talking about how to walk from one street corner to another,
09:33AM 10 we're talking about the street corners themselves, which are
11 physical devices, and there's four strings in a violin, and
12 that's also a disputed fact, but I don't think it's material in
13 this case. Thank you, your Honor.

14 THE COURT: All right. What should we take up next?
15 Mr. Van Nest.

16 MR. VAN NEST: I think we'd like to take up the
17 Daubert on Dr. Green, Mr. Green, and Ms. Meny is going to argue
18 that.

19 MS. MENY: And, your Honor, I have some slides there
09:33AM 20 as well. May I bring them to yourself and the clerks?

21 THE COURT: Yes.

22 MS. MENY: As your Honor knows, Mr. Green's damages
23 opinion in this case proffers a massive royalty base and a vast
24 range of huge royalty numbers. The size of Mr. Green's huge
25 numbers warrant the Court's special attention here because it

1 is unprecedented, especially given the narrow allegations of
2 the allegedly unique invention at issue here.

3 This is a classic case, your Honor, of where a
4 plaintiff is trying to put forward a large royalty base, number
5 in its base so that its rate number, ultimate rate number looks
6 small. It is Singular's burden to prove that Mr. Green's
7 damage model is appropriate, and it cannot do that here, and so
8 Mr. Green's motion, Mr. Green's opinion should be excluded.

9 I want to focus your Honor on two key issues today.
09:35AM 10 There are numerous problems with Mr. Green's opinion, but I
11 think the two most important ones to focus on are his cost
12 savings hypothesis that 100 percent of the purported costs
13 would go to Singular in the base, and also the fact that he
14 creates his base without -- by using the entire market value
15 rule instead of the smallest saleable patent practicing unit.

16 So the first reason that Mr. Green's opinion should be
17 excluded is because Mr. Green's base calculation gives 100
18 percent of the alleged cost savings from the TPU to Singular in
19 the base.

09:36AM 20 And I'll put forward the first slide, please. Your
21 Honor, this is a redacted version of how Singular creates its
22 cost savings analysis. They do essentially the same analysis
23 in Exhibit C, F and I, and they do it for different versions of
24 the pod and the donut, but as it shows, your Honor, the top six
25 lines essentially show what they are doing, and they use four

1 costs.

2 The saved accelerator cost and volume is essentially
3 their chip purchase cost number, and then the operating expense
4 savings, the electric expense savings, and the data center
5 construction costs, your Honor, are all data center related
6 costs. They are assuming, Mr. Green is assuming that the TPU
7 system in the data center saves a certain amount of costs.

8 The only reduction -- the top line numbers, your
9 Honor, are the total numbers, and the only reduction that
09:37AM 10 Mr. Green makes to those numbers is what is shown in the
11 middle, which is that he applies a weighted average cost of
12 capital of 12.5 percent when he does his cost savings analysis,
13 and he applies a weighted average cost of capital of 26 percent
14 for his excess returns analysis, and so that means that
15 Mr. Green's base, when you take the total amount minus the
16 discount, gives 100 percent of the costs allegedly saved to
17 Singular, and that is clearly erroneous under clear Federal
18 Circuit law.

19 Federal Rules of Evidence says that expert testimony
09:37AM 20 has to be based on specialized knowledge and a reliable
21 foundation, and at its core, that means it must be economically
22 rational, but Mr. Green's decision here unilaterally to give
23 100 percent of the cost savings to Singular in the base is not
24 economically rational, and Federal Circuit law makes clear that
25 it must be economically rational to go to the jury.

1 And I point your Honor to the *Uniloc* case, in which
2 the Federal Circuit rejected the plaintiff's 25 percent rule
3 saying it was not grounded in economics and also
4 *Laser Dynamics*, in which the Federal Circuit rejected a
5 plaintiff's one-third apportionment rule that the Federal
6 Circuit found was plunked out of thin air and lacked credible
7 economical analysis.

8 And the *Looksmart* case that we cited in our brief,
9 your Honor, shows exactly why Mr. Green's royalty calculation
09:38AM 10 in this way is economically irrational and unfounded. That
11 case actually involves almost the exact same calculation, your
12 Honor, that Mr. Green did here.

13 The *Looksmart* expert calculated the cost. He
14 calculated what he believed were the total cost savings, and
15 the only discount he applied was a 12 percent discount rate.
16 And what the *Looksmart* Court said was that that damage opinion
17 needed to be excluded because giving 100 percent cost
18 allocation is unsupported under rudimentary economic and common
19 sense because if a defendant gains nothing by using the
09:39AM 20 invention, the defendant would never engage in the hypothetical
21 negotiation, and I point your Honor to the *Looksmart* case at
22 star 3.

23 And lastly, your Honor, *Looksmart* also addresses
24 Singular's other argument on this issue, which is that they
25 gave Google other benefits by not including revenue within this

1 cost number, and Federal Circuit cases like *Uniloc* and
2 *LaserDynamics* are perfectly clear that you can't start with a
3 faulty premise and fix that premise by saying your intermediate
4 assumptions are okay, and that's what Mr. Green and Singular
5 are doing here, and *Looksmart* rejected the same opinion for the
6 same reasons.

7 The second reason that Mr. Green's damages opinion
8 here should be excluded, your Honor, is because he did not use
9 the smallest patent practicing unit to calculate his huge
09:40AM 10 royalty base. And Federal Circuit law is clear that unless the
11 plaintiff shows that there is a basis to use the entire market
12 valuable here, the smallest patent practicing unit must be used
13 as the base, and that is required in order to avoid skewing the
14 damage horizon and in order to ensure that the ultimate number
15 is isolating to the value of the limited alleged patented
16 improvement.

17 And Mr. Green is attempting to present a huge royalty
18 base here because he uses a broad TPU system number to create
19 his cost savings base, not the cost of the smallest saleable
09:41AM 20 patent practicing unit, which is the chip, and I want to walk
21 your Honor through why that is.

22 So, first of all, your Honor, there is no dispute in
23 this case -- next slide, please -- that Singular's alleged
24 patented invention is at most a subcomponent of the TPU chip.
25 This is from Dr. Khatri's report, and Dr. Khatri concedes that

1 what's at issue are the TensorCores, that those are included
2 within the chips, and that the devices comprise at least one
3 VPU, one MXU, and one Core Sequencer, which are in the
4 TensorCore in the chip, and that each and every limitation of
5 Claim 7 is met by the circuits contained within those three
6 modules, so within the chip.

7 Next slide, please. And, your Honor, there's two
8 versions of the TPU chip at issue here, but they're essentially
9 the same. This is a publicly-available version of the TPU
09:42AM 10 chip, and your Honor at Motions 2 to 3 and Ybarra Exhibit C at
11 617 has a much more detailed version than this, but this shows
12 just at a public level, right, that there are two TensorCores
13 but there are also numerous unaccused components to the chip
14 that are at issue here.

15 Next slide, please. But even, your Honor, if we look
16 at what Mr. Green said, Mr. Green says that the smallest
17 saleable practicing unit is the TPU board. He says that in his
18 deposition, and even if we take that assumption, which we
19 should not because Dr. Khatri is the one who should determine
09:42AM 20 what the SSPPU is here, even if you take Dr. Green's
21 assumption, at most, it's the TPU board that's at issue here.

22 Next slide, please. This is the slide of the TPU
23 board. Again, this is a public version, and your Honor has a
24 much more detailed version in the motion, but there are four
25 chips on the TPU slide, and there's no dispute that there are

1 numerous unaccused components contained within the TPU board.

2 Next slide, please. It's also there's no dispute,
3 your Honor, that the boards are put together into what's called
4 a TPU system. That's what Mr. Green calls in his report,
5 either a donut or a pod, and the system itself has numerous
6 unaccused features, including software in the interconnect, and
7 Mr. Green actually admits that because he reduces the value of
8 those features or says he does from the rate because he says
9 that they have some relevance to the rate. He includes them in
09:43AM 10 his base.

11 Next slide, please. So, your Honor, the TPU chip is
12 where the infringing, alledgedly infringing technology is.
13 That's incorporated into a board. That goes into a system.
14 The system goes into the data center, and what Mr. Green's
15 damages opinions on are based on here is the TPU system and the
16 data center, not the TPU.

17 And I'll say, your Honor -- next slide, please -- when
18 you look at this damages analysis by Mr. Green, it is clear
19 that the fact that he is using TPU systems is driving his
09:44AM 20 massive royalty base.

21 Next slide, please. And we know that because
22 Mr. Green's system is based on TPU pods and TPU donuts. This
23 is his title of his exhibits on how he calculated it.

24 Next system, please. And Mr. Green admits that the
25 TPU system includes items other than the chip including

1 interconnects.

2 Next slide, please. And Singular's opposition at 16,
3 your Honor, admits that using the chip would give you a much
4 smaller royalty base, and that's an important admission here.
5 We disagree with their statement that the way this was
6 calculated is based on a per chip level, but they admit, your
7 Honor, in their opposition at 16 that if Mr. Green had used the
8 chip as the smallest saleable patent practicing unit, the
9 royalty rate would be much lower here.

09:45AM 10 And I'll point, your Honor, to the *Ericsson* case.
11 We've cited a bunch of our cases in our motion on this, but
12 what *Ericsson* says is the evidentiary principle that is
13 specifically applicable to the royalty base is that courts must
14 insist on a more realistic starting point for our royalty
15 calculation, often the smallest saleable unit, and at times
16 even less, and we've cited numerous Federal Court cases that
17 say when you are calculating a base, you cannot use more than
18 the smallest practicing unit unless you can establish the
19 entire market value rule applies, and that's the *LaserDynamics*
09:46AM 20 case, the *Ericsson* case, the *Commonwealth* case, the *Power*
21 *Integrations* case, the *VirnetX* case, and then the District
22 Court case from *Microchip*, your Honor.

23 And as *Microchip* shows, when we are talking about the
24 alleged invention being within a chip level, the plaintiff has
25 to show how the accused functionality in the chip creates cost

1 savings across the system as a whole in order to use the TPU,
2 in order to use the system as the base, and there is absolutely
3 no showing by Mr. Green that the chip or the board creates to
4 the cost savings, and it's clear from his report at page 63
5 that his cost savings analysis is based on the cost savings
6 benefit from the deployment of the quote, unquote, "systems,"
7 your Honor, the pods and the donuts, not the chips or the
8 board.

9 For that reason, Mr. Green's damages opinion is
09:47AM 10 subject to Daubert and should be excluded.

11 THE COURT: Okay. Thank you. Who is going to
12 respond?

13 MR. DOHERTY: Good morning, your Honor. I believe you
14 have my slides. There's confidential information, so they
15 won't be on the screen. I have copies for the clerks.

16 THE COURT: Yes, I have it.

17 MR. DOHERTY: Your Honor, I'll start with the entire
18 market value rule. Mr. Green's opinions do not implicate that
19 rule at all. The entire market value rule seeks to prevent the
09:47AM 20 patentee from inflating the royalty base, as counsel stated, in
21 order to then apply a smaller royalty rate and make it look
22 like what was done was reasonable.

23 Mr. Green's approach on the other hand is a straight
24 cost savings methodology. It's a cost savings methodology that
25 Google's damages expert, Ms. Stamm, does not dispute. In fact,

1 Ms. Stamm applies her own cost savings methodology, she just
2 disputes the non-infringement alternative that Mr. Green used.

3 Now, Google's entire presentation ignored the use that
4 Google makes of the invention, and if you look at our first
5 slide, it's basic that under Section 284, upon a finding of
6 infringement, the patentee is entitled to no less than a
7 reasonable royalty for the use made of the invention.

8 That's as basic as it gets, and a well-accepted
9 methodology, as I said, is the cost savings methodology. We
09:48AM 10 know that from *Prism* and the other cases that we cite in our
11 briefs, and it's perfectly acceptable to do exactly what
12 Mr. Green did, which was to say how else could they have
13 achieved what they were seeking to achieve, which was to
14 generate much more compute power than they were able to at the
15 time.

16 And it's perfectly acceptable to determine the cost
17 savings that the infringer avoided by infringing, and if you go
18 to the next slide, we know the use that Google makes of this
19 invention.

09:49AM 20 Google does not use TPUs in isolation. They're always
21 used in conjunction. As they state in their brief, a single
22 TPUv2 chip would take 60 to 400 days to run typical
23 machine-running workloads. Thus, Google designed its TPU
24 systems to be networked so that multiple chips would work in
25 conjunction.

1 Now, Mr. Green analyzes the TPU vs. the GPU in the
2 system because that is how Google uses it. The GPU is also
3 used in systems, and it's never used in isolation. It's also
4 used on boards. It's also used with interconnects, just like
5 the TPU, so to say that analyzing is used in the system is not
6 a chip-to-chip comparison doesn't hold water. You're comparing
7 the capability of the chip in the context in which Google uses
8 it, and this is exactly what Google does itself.

9 If you go to slide 5, your Honor, this is the document
09:50AM 10 that we call the Patterson memo. Dr. Patterson is a Turner
11 Prize winner. It's equivalent of a Nobel Prize in computer
12 science. He's one of the most well-respected computer
13 scientists in history. He also works for Google. He prepared
14 an analysis that's in this document that's called, What If
15 Google Deployed V100s Instead of DragonFish, which is the V3
16 chip, and Dr. Patterson did not analyze it on a one-to-one
17 chip-to-chip basis, he analyzed it, as Mr. Green did, which is
18 the context in which Google uses it, which is required by the
19 law.

09:51AM 20 And if you look at the chart at the bottom of that
21 slide, what Dr. Patterson figured out is that the number of GPU
22 chips it would take to equal a compute power of 180,000 VG
23 chips, and he concluded that in a small-scale system for every
24 183 DragonFish chips, it would take 625,000 GPUs, and in a
25 medium scale system, it would take 862,000 GPUs to equal the

1 compute power they were able to generate with 180,000 TPUs.

2 Now, if you ignore that volume and you ignore the use
3 made of the invention, I think what Google's arguing is that
4 what Mr. Green should have done was simply take the number of
5 deployed TPUs and figure out the cost differential between that
6 number of TPUs and that number of GPUs.

7 The problem with that approach, your Honor, is that it
8 ignores the use that Google makes because you could never
9 generate the same compute power using the same number of GPUs.

09:52AM 10 It's a 5X number for the V3, and if you go to the next slide,
11 this is an exhibit from Mr. Green's report, and it shows that
12 Mr. Green was able to use Google's own documents to come up
13 with a multiplier for both the V3 and the V2 and using medium
14 scale pods and multipliers for small scales training in donuts.
15 That shows the numbers of GPU chips that would be necessary to
16 equal a compute power. That's a non-infringing alternative.

17 If you just use the same number of GPUs as they used
18 in the deployed TPUs, the GPU is not a non-infringing
19 alternative because it cannot come close to generating the
09:53AM 20 compute power that Google needs.

21 Now, all of Mr. Green's cost savings analysis starts
22 with the chip. If you go to the next slide, the top line shows
23 the number of TPUs deployed in each quarter. Mr. Green takes
24 that number and the TPU cost, \$2500. He shows the multiplier
25 of the number of GPUs you'd need to generate the equivalent of

1 compute power, and he applies the cost of the GPU, which is
2 \$6,000, and that cost differential is what Mr. Green uses to
3 determine how much Google would have had to spend to buy GPUs
4 and what the cost differential is between what they would have
5 had to pay for GPUs and what they actually paid for TPUs. And,
6 again, this is all from Google's own documents.

7 If we can go to the next slide. This shows the total
8 cost savings. Again, the first line shows the cost
9 differential. It's a very large number, but that's only a very
09:54AM 10 large number because Google deployed so many TPUs. The numbers
11 here are large because of Google's massive use of the
12 invention.

13 So that first line is a direct chip-to-chip
14 comparison, and we didn't admit, contrary to counsel's
15 assertion in that last slide, our point was in our brief, if
16 your Honor was to accept the argument that you can only compare
17 the chips, well then, Mr. Green has done that math.

18 Now, that's not proper because in order to generate
19 the same compute power using GPUs, it takes a lot more energy,
09:55AM 20 and, in fact, using Google's own documents again, we were able
21 to show that they would have had to actually build additional
22 data centers, and that's where the additional cost savings come
23 in that slide, and it's all rooted in Google's own documents,
24 your Honor.

25 As in any case, Mr. Green was required to tie the

1 proof of damages to the footprint of the invention in the
2 marketplace, and *Prism* says you can do that by tying it
3 directly to the evidence in the case, and here everything that
4 Mr. Green does is tied back to a Google document.

5 Now, Google argues that Mr. Green allocated all of the
6 cost savings to Singular. That's not true. Now, counsel said
7 that in the *LaserDynamics* case, the Court rejected the patentee
8 from plucking out of thin air a percentage.

9 We plucked out of Google's own documents the twelve
09:56AM 10 and a half percent weighted average cost of cap. Mr. Green's
11 application of the twelve and a half percent weighted cost of
12 capital is what Google uses when it models an investment
13 internally, and they may call it a discounting. They use it as
14 a hurdle rate. It's what they need to make in order to have a
15 return. It's their normal return on investment.

16 Now, Mr. Green applies the twelve and a half percent
17 weighted average cost of capital exactly the same way that
18 Google does internally. He also applies the 26 percent mean
19 sharp percentage, which is what they use, Google uses for its
09:57AM 20 more risky, its riskier investments.

21 Now, those are both hurdle rates, and, in fact, what
22 counsel didn't mention is that Ms. Stamm, Google's own expert,
23 takes the exact same approach. You'll see in the next slide in
24 paragraphs 99, 108 and 185 of Ms. Stamm's report, she applies
25 the weighted average cost of capital to her bf20 analysis. She

1 claims that the non-infringing alternative is not the GPU, it's
2 a chip using bf20 instead of bf16.

3 She applies the weighted average cost of capital,
4 excuse me, your Honor, to reduce the cost savings related to
5 the design and development of a bf20 chip down to 12.9
6 millimeters. She says that's a starting point. That's the
7 same thing Mr. Green did. He's not telling the jury what the
8 reasonable royalty is, he's saying this is where it would have
9 started in a hypothetical negotiation.

09:58AM 10 All of this challenge to the appropriate discount rate
11 or hurdle rate is for the jury to decide. It goes to the
12 weight, not the admissibility, your Honor.

13 Eventually in her report, Ms. Stamm actually comes out
14 and says that the \$12.9 million number is the amount that the
15 parties would have agreed to in a hypothetical negotiation.
16 That, according to Ms. Stamm, gives benefit to Google, and
17 that's the result of a 12.5 percent, or, I'm sorry, a lower
18 weighted average cost of capital of 11.08 percent, so Mr. Green
19 is actually providing more benefit to Google.

09:58AM 20 And then the last slide, your Honor, shows that
21 Ms. Stamm also applies the 26 percent rate, the Moonshot rate,
22 and at the end of paragraph 12, she states, "The upper end of
23 the range gives all the benefits to Singular, whereas the low
24 end of the range allows Google to share in the benefits based
25 on Mr. Green's proposed hurdle rate of 26 percent."

1 So when Ms. Stamm applies that hurdle rate, it
2 provides benefit to Google. When Mr. Green does the same
3 thing, it provides all of the benefit to Singular. It just
4 doesn't hold water, and that illustrates more, your Honor, that
5 that goes to the weight, not the admissibility of Mr. Green's
6 opinion.

7 With that, I'll rest on my papers, your Honor.

8 THE COURT: All right. Ms. Meny.

9 MS. MENY: Your Honor, quickly. First of all, on
09:59AM 10 their entire market value rule argument, Federal Circuit law
11 that we cited to you is perfectly clear that it is the
12 plaintiff's obligation to apportion in every single case, and I
13 would point your Honor to the *VirnetX* case, which says that no
14 matter the form of the royalty, the plaintiff must only seek
15 those damages attributable to the infringing features, and
16 that's our precise point here, your Honor, is that the
17 infringing features are in the chip.

18 Mr. Green has clearly used symptoms-based numbers, not
19 chip-based numbers, and he is therefore taking value that are
10:00AM 20 found from the system, adding it to his base so that he can
21 provide a huge base number and then trying to say that that
22 number isn't so bad once you look at it as a rate, and the
23 *VirnetX* case and the *LaserDynamics* case make clear that that is
24 not allowed.

25 And the other thing, your Honor, I will say is they

1 keep saying that Mr. Green relied only on Google's own
2 documents. Mr. Green admitted in depo, and we provided your
3 Honor with the citation that Google's own documents actually
4 have performance numbers at both the chip level and the system
5 level. He said that in his deposition at page 169, and we
6 provided your Honor that quote in Exhibit D.

7 Mr. Green chose to ignore the chip level information
8 and instead used the system level information, and he chose to
9 ignore it, your Honor, because if you look at those documents,
10:01AM 10 those documents show that there is a very small difference
11 between TPU chips and GPU chips on power issues, which is what
12 they claim their invention does when you look at it at a chip
13 level, and the only significant difference shows up at the
14 system level, and that is because there are a lot of nonaccused
15 features at a system level like the interconnects.

16 And the other thing, your Honor, that I'll point out
17 is they keep saying also that they need, that Mr. Green
18 appropriately looked at it in the use that Google makes, and,
19 again, I would point, your Honor, to the *VirnetX* case on that
10:01AM 20 because that's exactly the argument that the plaintiffs made
21 there, and what the Court said there is that the plaintiff
22 can't hide behind Apple sales model to avoid the task
23 apportionment and that the plaintiff needs to identify the
24 patent practicing feature with a sufficiently closed
25 relationship to the claimed functionality, and if they haven't

1 done that, their base is in error, and so Mr. Green has not
2 done that. He has not given any reason for this court to
3 believe that the entire market value rule applies here, and
4 instead what he's done is applied the entire market value rule
5 and given a large base so that the large base can go to a jury.
6 That is error, and our Daubert should be granted.

7 MR. DOHERTY: Just quickly, your Honor.

8 THE COURT: Yes.

9 MR. DOHERTY: Your Honor, the cases that Google relies
10:02AM 10 on are inept. For example, *LaserDynamics* involved an optical
11 disk drive. The plaintiff in that case used the total revenues
12 on the sales of the entire laptop and then just applied a two
13 percent running royalty to that and ignored comparable licenses
14 that weren't based on a percentage of total revenues. It's
15 completely inept.

16 Now, coming back to the chip level vs. System level
17 bringing you back to the Patterson memo, your Honor, that
18 document, Dr. Patterson directly attributes the 180,000 TPUs
19 versus the 825,000 GPUs to the invention. He says it's because
10:03AM 20 of bfloat16 app scale, so to argue that Mr. Green should have
21 simply compared performance at the chip level, it ignores the
22 use of the invention. They don't use it that way. They use
23 TPUs instead of GPUs because TPUs perform much better in fewer
24 numbers at scale. That's how they use it, and that's how
25 Singular -- it's on that basis that Singular is entitled to

1 recover.

2 And, again, if Mr. Green wanted to rely on the entire
3 market value of the TPU systems, he would have relied, like the
4 plaintiffs in all those other cases did, on the total revenues
5 generated by TPUs. TPUs since 2017 have powered all of
6 Google's main products, and as publicly disclosed in SEC
7 filings, that revenue between I believe it's 2017 and 2021 or
8 2022 is upwards of \$900 billion. Mr. Green didn't start at
9 \$900 billion dollars. He was able to isolate the cost savings
10:04AM 10 directly attributable to Google's choice to use TPUs instead of
11 GPUs. Thank you, your Honor.

12 THE COURT: All right. Thank you.

13 MR. VAN NEST: If time allows, your Honor, we have one
14 more motion we'd like to address with the Court today.

15 THE COURT: All right.

16 MR. VAN NEST: And that's our Daubert on Dr. Khatri,
17 and Mr. Bhansali is going to handle that.

18 MR. BHANSALI: Your Honor, may I approach to hand up
19 slides?

10:05AM 20 THE COURT: Yes.

21 MR. BHANSALI: Good morning, your Honor, Asim Bhansali
22 for Google. In the interest of time, your Honor, I will be
23 brief. There are quite a few problems with Dr. Khatri's
24 opinion. We've laid them out in our briefing in the Daubert
25 motion. I'm, of course, happy to answer any questions that

1 your Honor has and will want to address anything that Singular
2 refers to. I want to also focus with respect to Dr. Khatri's
3 opinions today on the apportionment issues.

4 You've heard debate between counsel with respect to
5 Mr. Green's opinion and how he was using a system level
6 analysis rather than a chip level analysis. Dr. Khatri's
7 opinions have the same problem. He also uses a system level
8 comparison, and we've included in our papers and you also have
9 at slide 5 in the slide deck where Dr. Khatri admits to using a
10:06AM 10 system level comparison, and like Mr. Green, he also ignores
11 the chip level comparison documents that were available to him
12 and that he even cited in his report. We've again cited those
13 in our papers and also included one of the chip level documents
14 as cited by Dr. Khatri in his report at slide 3 of the deck.

15 I won't belabor the sort of legal framework around
16 that because I think it's been quite appropriately addressed.
17 I will make one point, which is that at the end of his
18 argument, counsel referred to the Patterson document and how in
19 counsel's view, the Patterson document attributes all these
10:07AM 20 benefits to the bfloat16 format.

21 Even if that were an appropriate read of the document,
22 your Honor, I would just note that Dr. Khatri himself, nowhere
23 in his report says that bfloat alone is practicing the patent
24 claim, so even if Dr. Patterson is somehow attributing these
25 benefits to bfloat, Singular and its experts have not tied

1 those benefits adequately to the patent claim.

2 But Dr. Khatri's apportionment analysis suffers from
3 yet another problem, and that problem is that he fails to
4 apportion to the patentable improvement, so we've already heard
5 and there's no dispute that apportionment is required when the
6 accused product includes patented and unpatented features, but
7 as the *Omega's* patent case that we cited in our papers holds,
8 apportionment also requires that where there are patented and
9 unpatented features, and where a claim may include -- the claim
10:08AM 10 limitations themselves may include both conventional and novel
11 features, the damages apportionment, in this case, the
12 technical apportionment that feeds into the damages opinion has
13 to apportion to the patentable improvement. That makes sense
14 because you don't want a party claiming value based on
15 something that was already conventional and known in the art.

16 And so the question here, your Honor, is whether
17 Dr. Khatri's apportionment analysis appropriately applied that
18 standard. The answer is fairly clear that he did not.

19 And the reason is this, your Honor, following the
10:09AM 20 PTAB's decision in the Patent Trial and Appeal Board decision
21 in the IPRs in this case, it was determined that the
22 low-precision, high-dynamic range execution unit that's claimed
23 in the Singular patents was actually known in the art.

24 So, in other words, that was found to be an element
25 that was not a patentable improvement on the prior art. The

1 only aspect of the claims, the only element of the claims that
2 were found to be novel by the PTAB were the exceeds claims that
3 Mr. Van Nest discussed this morning in his argument.

4 Now, Singular is not appealing the PTAB's decision, so
5 under the precedent that we've cited, including a District of
6 Massachusetts case, *Intellectual Ventures vs. Lenovo*,
7 370 F. Supp. 3d. 251, Singular is bound by that PTAB decision
8 and, therefore, Singular is estopped from taking the position
9 that the LPHDR execution unit itself is a patentable
10 improvement.

11 Singular is bound to the position that the LPHDR
12 execution unit is conventional and known in the art, therefore,
13 under the *Omega* patent's decision, Dr. Khatri was not allowed
14 to apportion value to the LPHDR execution unit itself. He had
15 to apportion value just to the exceeds claims.

16 Dr. Khatri does not do that. If we could show slide
17 2, please. Slide 2 has multiple excerpts from Dr. Khatri's
18 opinions regarding apportionment. In all of those excerpts,
19 Dr. Khatri is basing his apportionment on the value that he
20 says is provided by the LPHDR execution unit.

21 What is notable, your Honor, is nowhere in those is it
22 five different paragraphs from Dr. Khatri's opinion does he
23 offer an opinion as to the value that's provided by the exceeds
24 limitation, but the exceeds limitation is the only patentable
25 improvement and, therefore, that is all that Dr. Khatri can

1 apportion value to.

2 Now, Singular doesn't dispute any of this. What
3 Singular says is, oh, well, that doesn't matter because the
4 exceeds claim just requires a lot of LPHDR execution units, and
5 since Dr. Khatri is apportioning to LPHDR execution units, then
6 it's okay because the novel portion of the claim is just that,
7 it's a lot of execution units.

8 Well, your Honor, that's not true as a matter of
9 Dr. Khatri's opinions, nor is it an accurate application of the
10:12AM 10 law. As a matter of Dr. Khatri's opinions, as you can see in
11 these paragraphs, he is not attributing value to having 100
12 more LPHDR execution units than units that perform 32-bit
13 multiplication, which is what the patent requires, he's just
14 attributing value to LPHDR execution units.

15 Moreover, the law does not give Dr. Khatri that amount
16 of leeway. The *Omega* patents case is clear that the
17 apportionment has to be based on the patentable improvement,
18 and the patentable improvement here is very narrow, it's this
19 having the LPHDR units and not just having a lot of them but
10:13AM 20 having 100 more than units that do 32-bit multiplication.

21 There's nowhere that Singular cites that Dr. Khatri
22 bases an apportionment analysis based on that improvement, and
23 for that reason, in addition to his application of the system
24 level comparison, Dr. Khatri's opinion is properly excluded
25 under the Daubert standard.

1 And, your Honor, subject to that, we will rest on our
2 papers with the remaining issues that we've raised with regard
3 to Dr. Khatri's opinions.

4 THE COURT: Okay.

5 MR. SEEVE: I will be responding to Mr. Bhansali's
6 arguments. I do have slides. I believe your Honor has a copy.
7 If the clerks would like copies, I have extras.

8 So let me start with Mr. Bhansali's theory that
9 because of the IPR, somehow the scope of the asserted claims in
10 this case, which were upheld in the IPR are narrowed somehow
11 because of some other claims that got invalidated.

12 The idea here that Mr. Bhansali seems to be espousing
13 is that if one claim gets invalidated somewhere and that claim
14 has a limitation of X, that every other claim in the world that
15 includes that same limitation, you just cross that limitation
16 out because it's been found to be conventional, the claim no
17 longer includes X. That's what Mr. Bhansali's position
18 essentially is, and there is literally no support in the law.
19 There's no statute, there's no case law that has ever applied
20 this standard in apportionment in a damages calculation
21 generally or anywhere else.

22 The *Omega* patent case that Mr. Bhansali just
23 mentioned, the other cases that Google cited, not in a single
24 one of them is there an IPR decision where one claim was
25 invalidated and another was upheld where the damages analysis

1 found that you needed to take into account invalidating that
2 one claim and cross those line items out of the claim that was
3 upheld, simply no law whatsoever.

4 In fact, the patent statute, 35 U.S.C., Section 282
5 clearly states that claims stand on their own. It says -- and
6 this is the first slide in my slide presentation. It
7 specifically says that dependent or multiple dependent claims
8 shall be presumed valid even though dependent upon an invalid
9 claim, and that's exactly the same situation we have here.

10:16AM 10 The independent claim that is not asserted in this
11 case was invalidated in the IPR, the dependent claim, which was
12 also a challenge in the IPR, was upheld, and that claim is
13 asserted. It's valid regardless of the decisions in the IPR.
14 The IPR decision has absolutely no bearing on apportionment.

15 Now, Google cited the *Omega* patent case and a number
16 of other cases, and these cases actually stand for a totally
17 different proposition from the one that Mr. Bhansali is
18 asserting. This is at page 3 of my slides. You can see these
19 three cases are the very cases that Google's brief relies on.

10:17AM 20 In *Omega* patents, which is the middle one, it says
21 that you have to adequately and reliably apportion between the
22 improved and conventional features of the accused product, not
23 the claim, the accused product.

24 So that means that, okay, there's a feature in the
25 accused product that isn't part of the invention, sure, you

1 don't get damages for that feature. That's not part of your
2 invention. What it doesn't mean is that you take the claim and
3 you cross out the features that some other decision might have
4 invalidated, limitation by limitation, and you don't get
5 damages for those particular features. None of the cases that
6 Google cited stand for that proposition.

7 You can see *Ericsson*, which is the top of the slide,
8 also cited by Google, again, the value to be measured is only
9 the value of the infringing features of an accused product.

10:17AM 10 Now, the exceeds limitation, the LPHDR execution unit, all of
11 these features are in the asserted claims, which are valid.
12 The PTAB upheld their validity, and they, therefore, are part
13 of an apportionment analysis, part of the value that is
14 ascribed to the patents-in-suit.

15 The *Micron* case, also cited by Google, says pretty
16 much the same thing. There's literally no law that supports
17 Google's novel proposition that some claim somewhere is
18 invalidated in an IPR, then you get to take a line item
19 analysis of other claims in other patents maybe or in the same
10:18AM 20 patent and cross out those limitations because they no longer
21 matter, simply not supported by law.

22 It also doesn't make sense as a matter of policy.
23 Everyone knows that inventions are built on what has come
24 before. Concrete, for example, as we mentioned in our briefs
25 is water, it's sand, and it's gravel, three components that

1 have been known since antiquity. Concrete was invented later,
2 and it's a hugely useful product. It's a mixture of those
3 three things.

4 Under Google's theory, if a person invented concrete,
5 let's say today, even though it was invented long ago, a claim
6 directed to a mixture of water, gravel, and sand.

7 THE COURT: There's cement in there, I think water,
8 gravel and sand.

9 MR. SEEVE: You're right.

10:19AM 10 MR. BHANSALI: I didn't want to interrupt, but that's
11 correct.

12 THE COURT: A castle would wash away with the waves.
13 Anyway.

14 MR. SEEVE: Fair. So the three components of
15 concrete, whatever they may be are known, they're conventional,
16 and under Google's theory, a claim directed to combining those
17 three elements to make concrete would essentially be worth
18 nothing. You cross out the water, you cross out the cement,
19 you cross out the gravel, and then I guess they say in their
10:19AM 20 reply brief what you have left is the mixture. I don't know
21 what mixture means exactly. The claim limitation of mixing
22 things together, only that gets value. It's unclear what
23 exactly that would mean, but, as you said, for example, without
24 the cement, it would wash away, but the cement, I guess,
25 wouldn't be included under Google's damages theory, so it just

1 doesn't make sense, your Honor, as a matter of policy that
2 patent claims would be subjected to this line item veto
3 analysis based on what elements are supposedly conventional and
4 what elements are supposedly not.

5 Sorry, just one second. So I think that pretty much
6 is it except the brief mentions I think that Mr. Bhansali made
7 about the system and the chip comparison, which I also believe
8 is related to apportionment.

9 Dr. Khatri clearly cites chip level comparisons in his
10:20AM 10 report and uses them in his analysis. I'm not sure what the
11 objection is there that Mr. Bhansali is raising, but as our
12 briefing explains, computers have chips in them, and that's how
13 chips are used. You can't isolate a chip, stick a chip on a
14 table and evaluate its value, you have to isolate them as part
15 of -- or evaluate them, I'm sorry, as part of a computer
16 system. That's exactly what Dr. Khatri does in his
17 apportionment analysis.

18 Google also alleged, I don't believe Mr. Bhansali
19 mentioned it now but mentioned it in both of their briefs that
10:21AM 20 Dr. Khatri's apportionment analysis should be stricken because
21 he never explains in his report or at his deposition the proper
22 standard for apportionment. I think they knew that that was
23 untrue when he said it. It seems like they've backed off. I'm
24 not sure if they've withdrawn that allegation, but as we
25 explain in our briefs, Dr. Khatri very clearly explained the

1 correct standard for apportionment.

2 There were some other arguments in Google's briefing
3 that Mr. Bhansali didn't touch on, which I'll respond to
4 briefly, the question of whether Dr. Khatri's commercial
5 success testimony should be allowed because he's not an expert
6 on commercial success. This is what Google said. Google's
7 brief said that Dr. Khatri cited no evidence of commercial
8 success, but that's simply not the case.

9 Dr. Khatri -- just one moment. Dr. Khatri cited a
10:22AM 10 Google document that said, and I quote, "Google's best known
11 products and services, including Android apps, gmail maps,
12 photos, robotic search speech time and translate," et cetera,
13 "are powered by the accused TPU devices," so clearly the
14 flagship products of one of the largest companies in the world
15 are powered by the accused devices. You don't have to be an
16 economist to understand that that product is commercially
17 successful.

18 Dr. Khatri also ties his commercial success to his
19 technical opinions. He says, "The performance advantage of the
10:22AM 20 TPUs, and by extension the commercial success, is due in
21 significant part to the use of low-precision arithmetic."

22 Now, Dr. Khatri is an expert in computer science.
23 He's an expert in the evaluation of computer systems, so he's
24 talking about performance analysis and how it relates to
25 commercial success is perfectly within the purview of his

1 testimony.

2 Google also objected to Dr. Khatri's testimony and
3 described as relating to Google's state of mind. Now, this I'm
4 not sure if Google is withdrawing this. It didn't come up in
5 Mr. Bhansali's arguments.

6 MR. VAN NEST: No, we're not.

7 MR. SEEVE: In that case, I won't address it. First
8 of all, Dr. Khatri doesn't offer any technical or scientific
9 opinions about anyone's state of mind. Dr. Khatri reads
10:23AM 10 documents, he quotes those documents in his report, and some of
11 those documents relate to the rationale behind why Google did
12 certain things.

13 Now, many of these opinions are technical in nature.
14 For example, Dr. Khatri talks about quote, "The rationale
15 underlying Google's decision to use LPHDR execution units."
16 That's not a question about state of mind, that's a question
17 about architecture design in computers, a subject about which
18 Dr. Khatri is an undisputed expert.

19 Other statements that Google objected to in its brief
10:24AM 20 are merely statements that come directly from Google documents,
21 and Dr. Khatri is certainly allowed to read documents. There's
22 some examples that I have in my slides that relate to this
23 question of objective indicia of nonobviousness. Objective
24 indicia of nonobviousness, of course, are indicia that show
25 that a patented invention isn't obvious, and some of those

1 objective indicia involve states of mind.

2 As you can see on slide 4, we've got copying by
3 others. Well, whether something is copied, you know, requires
4 knowledge, and that's a thing of state of mind issue. Praise
5 is a question of state of mind, and skepticism is a question
6 that relates to state of mind. All of these are secondary
7 considerations of nonobviousness, and so Dr. Khatri is
8 definitely qualified to testify, and it's totally proper.

9 THE COURT: I'm not sure we quite call it state of
10:25AM 10 mind, which is subjective, but maybe objective manifestations
11 is state of mind. In other words, it's not what someone was
12 thinking, it's what someone said.

13 MR. SEEVE: You're absolutely right, your Honor.
14 You're absolutely -- yes, couldn't have been said better, and
15 it is what someone said, not what they were thinking that
16 Dr. Khatri opines on.

17 So if you look at, for example, page 5, this is what
18 Dr. Khatri cites to relating to copying. This is a Google
19 document, and it's a Google engineer saying, "My gut reaction
10:25AM 20 is nervousness." Well, as you said, your Honor, Dr. Khatri is
21 not inferring anything about anyone's state of mind, Dr. Khatri
22 is reading that e-mail and concluding from it that this guy's
23 gut reaction is nervousness.

24 It goes to the question of copying. If you look at
25 the next slide, praise, another objective indicia of

1 nonobviousness. You have a Google scientist, very
2 distinguished researcher called Andrew Yng e-mailing and
3 saying, "This is incredibly cool," again, not his state of mind
4 but what someone actually said in this case to the inventor
5 himself.

6 Another example of praise, and this one was one that
7 Google objected to in its brief. One second, I'm having
8 trouble with my pages here. These are contemporaneous notes
9 from Dr. Bates about a meeting he had with Google, and in his
10 contemporaneous notes, he reports that a Google engineer told
11 him that Jeff Dean is more excited than he has been for awhile.

12 Now, Dr. Khatri's not making any inferences here, he's
13 not a psychologist, he's merely reading the e-mail and
14 processing the information it contains. And, finally, when it
15 comes to skepticism, we have here a quote from a Google
16 engineer that says, this is slide 8, "I think that implementing
17 approximate arithmetic is a bad idea."

18 So these are the kind of statements that Google is
19 objecting to as being related to Dr. Khatri's state of mind. I
20 think they're clearly proper. It's clear why Google might want
21 them to be excluded from the case, but there's no legal basis
22 for doing so.

23 And, finally, I'd like to briefly address the headline
24 issue in Google's motion, which is this idea that Dr. Khatri
25 engaged in improper claim construction. Mr. Bhansali didn't

1 talk about it much, so I'll just address it briefly since he
2 didn't provide in a lot of detail, Dr. Khatri didn't construe
3 his term, "processing element," which is the core dispute,
4 simply didn't construe it.

5 Google itself defines the word "construe" as "provides
6 a definition of." Dr. Khatri never provided a definition of
7 processing element. Google doesn't point to one. I would
8 expect that if there were one, Google would only respond to me
9 and point it out, but I don't think there is one, and so, you
10:28AM 10 know, that alone should put this issue to bed. Dr. Khatri did
11 not construe the term.

12 Second, processing element isn't even a claim term.
13 If you look at the claim, "processing element" never appears.
14 It appears in this Court's instruction of the term, "execution
15 unit." None of the cases, none of the arguments that Google
16 makes addressed this factor. This isn't actually a claim term
17 that they're saying Dr. Khatri improperly construed, this is
18 part of the Court's construction of another claim term, so that
19 should, too, should put the issue to bed.

10:28AM 20 Third, Google doesn't make any actual objections to
21 what Dr. Khatri says about processing elements, it's purely a
22 procedural question. They say that because Dr. Khatri admits
23 he considered the specification in interpreting the term, his
24 entire report essentially should be included -- or excluded.

25 Well, that's simply not the case. Singular cited law

1 that says it's perfectly proper to consider the meaning of
2 plain terms in light of the specification. In context, Google
3 offered no response to this.

4 Again, I believe this is just sort of Google's attempt
5 to do an end-run around the Court's construction of "execution
6 unit," which does not include all of these limitations that
7 Google talks about in its briefs that it's trying to import
8 into this term, the limitation that memory needs to be
9 addressable, the limitation that the processing element can't
10:29AM 10 overlap with other processing elements. All of these are
11 things that Google is attempting to import into the claim, and
12 now they're saying because Dr. Khatri didn't import them
13 himself, his testimony should be excluded, and I believe -- so
14 there's so many issues that they raise, I just want to make
15 sure I've touched on all of them. I believe I have, so thank
16 you.

17 THE COURT: All right, Mr. Bhansali.

18 MR. BHANSALI: Thank you, your Honor. I'll start from
19 the end and work back up. If we could see slide 6 of the deck,
10:30AM 20 please. Your Honor, there's a theme I think that goes to my
21 responses to a number of the points that Mr. Seeve made, which
22 is that Dr. Khatri is an expert, he's an expert witness who is
23 subject to particular strictures on the rules of evidence and
24 case law on what he can testify to. He's not an advocate, he's
25 not a fact witness, and he's certainly not the Court, and that

1 limits what Dr. Khatri can do.

2 So let's start with the claim construction issue. If
3 we look at slide 6, with Dr. Khatri in his report, nowhere in
4 his report, having said that he was applying the plain and
5 ordinary meaning of "processing element," I asked him at his
6 deposition, "Do you have an person as a person of ordinary
7 skill in the art of what a processing element is?" And this is
8 actually one of his more succinct responses, it's only three
9 paragraphs. Most of them were far more perplex. What does he
10:31AM 10 say? He says -- well, first he just recites the Court's
11 construction, which doesn't answer the question of how he's
12 interpreting "processing element," and then he says, "For
13 further edification in terms of what the processing element
14 was, they would refer to, you know, the specification, which is
15 the intrinsic evidence, they would first look at rather than,
16 you know, just apply their own sort of understanding of what a
17 processing element is or was."

18 Well, what Dr. Khatri, the process he's describing
19 there is the exact opposite of what the law requires. The law
10:31AM 20 requires that whether it's a claim term or a claim
21 construction, if it hasn't been further construed by the Court,
22 an expert has to apply the plain and ordinary meaning. We
23 don't disagree that a term can, and in patent law, as we all
24 know, often is defined by reference, by consideration of the
25 specification, but that's a province of the Court, and under

1 Federal Circuit law, interpreting a claim term or a term that's
2 part of a construction in light of the specification is
3 reserved exclusively for the Court. That's not an issue that
4 an expert can testify to the jury about because that would mean
5 that you're asking the jury to interpret claim terms, which is
6 improper under a line of Federal Circuit cases that we cite in
7 our papers, including the '02 *Micro* case.

8 That's the problem with Dr. Khatri's opinion, and,
9 again, he's an expert. He didn't say in his report that he was
10:32AM 10 applying the plain and ordinary meaning, and I asked him at his
11 deposition because that wasn't clear, and under oath, he would
12 not say that his understanding that he applies in his report of
13 a processing element is the plain and ordinary meaning that an
14 expert applies, and so we're all left to wonder what Dr. Khatri
15 is applying, what standard he's applying because actually, as
16 Mr. Seeve points out, he doesn't really explain that in his
17 report, but the problem is if Dr. Khatri is allowed to testify,
18 what is he going to do? He's taking his interpretation of the
19 specification and offering an opinion to the jury that's based
10:33AM 20 on that. That's improper.

21 If they wanted to further interpret "processing
22 element," rather than applying the plain and ordinary meaning,
23 the time to do that was in the claim construction process, but
24 we all agreed that -- both sides agreed, we had some other
25 disputes around execution unit, but we agreed that it was

1 "processing element," and the further application of that would
2 be based on -- thus, based on the plain and ordinary meaning.

3 As far as the state of mind issue, your Honor, I was a
4 little unclear on what Mr. Seeve's argument was because he said
5 that he wasn't offering any -- Dr. Khatri is not offering any
6 technical or scientific opinions.

7 Well, he's a technical and scientific expert. If he's
8 not offering technical or scientific opinions, then he
9 shouldn't be testifying about it. That's very clear under the
10:34AM 10 Rule 702 that an expert witness, particularly when you're
11 providing the imprimatur of expert testimony, your expertise is
12 limited to matters within their expertise, and I think the
13 series of documents that Mr. Seeve pointed to and that are in
14 the slides underscore this point. It doesn't require an expert
15 to interpret when somebody is saying, "Oh, that looks pretty
16 cool" or "Jeff is more excited than he's been for awhile,"
17 that's fact testimony.

18 Now, we may have a discussion or a debate later on as
19 to relevance of those documents as factual evidence, but one
10:35AM 20 thing is clear, there's no expert opinion being offered as to
21 those documents.

22 He's simply serving as a mouthpiece for factual
23 documents, and we cited a number of cases, your Honor, in our
24 briefing saying that that's improper, they didn't respond to a
25 single one in their opposition or attempt to distinguish it,

1 and they don't -- and even today, I didn't hear any suggestion
2 of where Dr. Khatri is offering any technical opinion that
3 would aid the jury in understanding those documents. The fact
4 that they may believe they're relevant to a particular issue
5 doesn't allow Dr. Khatri to testify about them.

6 As to commercial success issue, your Honor, the law is
7 actually quite clear that Dr. Khatri as a technical expert, and
8 we don't challenge his qualification as a technical expert,
9 lacks the expertise to testify about commercial success, and
10:36AM 10 his opinion is about commercial success. He has several
11 opinions about the technical aspects of the chip, which we are
12 challenging on our apportionment points that we raised, but he
13 is not qualified as a computer scientist and engineer to
14 testify on commercial success.

15 And, your Honor, getting back then to the
16 apportionment issues, I think it might be worth just in the
17 context of the cement, water, gravel analogy actually going
18 back to the case law because the *Exmark* case, which we cited in
19 our papers, which is another case where the Federal Circuit
10:36AM 20 says that apportionment has to be based on the patentable
21 improvement gives a nice example.

22 There you had a claim that a ride-on lawnmower -- and
23 lawnmowers have been around for awhile. I remember having to
24 mow the lawn when I was in middle school at my house, but, more
25 recently, there was a patent at issue in this case that had an

1 improved flow control baffle, and the Federal Circuit made it
2 clear that the patentee could not apportion value to an entire
3 lawnmower, they had to apportion value to the patentable
4 improvement, and the patentable improvement was the flow
5 control baffle.

6 And, similarly here, the only patentable improvement
7 they can claim is the exceeds claim. The rest of the device is
8 either something that's not even claimed in the patent or it's
9 something that's claimed in the patent that the PTAB has
10:37AM 10 already found to have been known in the prior art, and,
11 therefore, conventional, and the fact that it's covered in the
12 claims, just as the claim in *Exmark* covered the entire
13 lawnmower, doesn't allow Dr. Khatri to apportion value based on
14 th full claim. He has to apportion based on the patentable
15 improvement.

16 Now, Mr. Seeve said, well, we haven't pointed to any
17 case that followed an IPR decision where apportionment was
18 limited to the elements that were found to be novel, but the
19 fact that that's not come up in the IPR context, your Honor, is
10:38AM 20 simply irrelevant.

21 The IPR decision, which is part of the file history of
22 the patent and is binding on Singular, because they're not
23 appealing it, establishes what the novel element subject to our
24 appeal of and our invalidity case here, but for purposes of
25 Singular's expert, establishes what the novel elements of the

1 claim are, and the only novel element of the claim is the
2 exceeds claim, and under *Omega* and *Exmark*, Dr. Khatri was
3 required to apportion based on that novel element, your Honor.

4 THE COURT: I haven't read the lawnmower case, but
5 it's a little trickier than just saying it's the entire
6 lawnmower or it's the improvement because, of course, things
7 are systems. I assume a flow control -- I don't even know what
8 you're controlling, the fuel to cut grass, I have no idea, air,
9 but presumably it has things like an on-off switch or a
10 butterfly valve or something that is conventional, and it's a
11 combination of things, right, it's the invention, whatever it
12 is you've invented, even if you are combining completely
13 conventional elements, it's still everything together, you
14 know, whatever your improvement is, right, so it's not quite as
15 simple as one narrow thing, right?

16 So if you take a conventional processing unit and you
17 add the exceeds thing and that's your invention, isn't it the
18 two taken together?

19 MR. BHANSALI: No, your Honor. I would say a couple
20 of things on that. First, in the lawnmower case, the claim
21 covered the whole lawnmower, right, and so you have the same
22 issue, right? I mean, you could say, well, I can't be limited
23 to the flow control baffle because you're adding that to the
24 lawnmower, and the point of the Federal Circuit was it's the
25 job of the expert to isolate the value that's added by the flow

1 control baffle, so to take our --

2 THE COURT: The improvement really, right, the thing
3 you have invented?

4 MR. BHANSALI: Exactly, your Honor. And here, that's
5 a lot easier. This is a lot easier case than the cement,
6 water, and sand case because in cement, water and sand, you
7 would have to say, well, okay, you know, how do I value
8 concrete relative to any one of those alone, to your sand
9 castle analogy, right? So what's the value of concrete versus
10:40AM 10 a sand castle? Well, one washes away, one doesn't, right? So
11 there is still some degree of isolation here that's required,
12 but it's a lot simpler in this case because we know what we
13 have, right, we have an LPHDR unit that's conventional.

14 They're estopped from taking a contrary position, and
15 so all Dr. Khatri had to do is say, okay, well, how much value
16 is being added by taking the rest of the claim, which has these
17 other elements, the LPHDR unit principally and adding this
18 exceeds piece to it, and he doesn't even attempt to do that,
19 and that's really the problem, your Honor.

10:41AM 20 The fact that it might be a difficult task does not
21 make -- does not excuse the patentee under the case law from
22 apportioning only based upon the patentable feature because
23 Mr. Seeve mentioned policy, right, and I think the policy
24 rationale here is quite clear. They are not allowed, they
25 don't have monopoly on the conventional features, and,

1 therefore, they cannot claim damages based upon any
2 conventional feature, and so if their point is that the exceeds
3 limitation has been combined with this conventional feature,
4 then the thing that Dr. Khatri was obligated to do was to say,
5 okay, here's what's conventional, here's what's been added,
6 here's the value that's been added by that, and maybe he may
7 say, well, the combination creates some value, and we have to
8 see what that is and see whether that fell within the scope of
9 proper apportionment, but he never did that, so there's
10:42AM 10 no -- it's not as if he actually valued this combination and
11 we're challenging that, he never did that, as we saw from slide
12 2, he is simply doing his apportionment based upon the value
13 attributable to the LPHDR unit. That's clearly apportioning
14 based upon conventional features and is outside the scope of
15 what the law allows.

16 THE COURT: Okay. All right. Why don't we do this.
17 We've got about 10 minutes. Let me turn to Singular, is there
18 something you want to take up?

19 MR. SEEVE: There is, if I could respond very briefly
10:43AM 20 to some of Mr. Bhansali's points.

21 THE COURT: Go ahead.

22 MR. SEEVE: So super briefly. Mr. Bhansali once again
23 reiterated that Dr. Khatri didn't include the standard for
24 apportionment in his report, and it's simply not true. It's at
25 paragraphs 283 and 284. The law that supposedly says that the

1 specification has no relevance to the plain and ordinary
2 meaning that Mr. Bhansali refers to simply doesn't exist. The
3 law actually says, "The claims are directed to the invention
4 that's described in the specification, they do not have meaning
5 removed from the context from which they came." That is the
6 law.

7 Google did not respond to that case which Singular
8 cited. When it comes to the state of mind business, what I
9 said, Dr. Khatri wasn't providing a technical opinion, I meant
10:44AM 10 the technical opinion as a psychologist about someone's state
11 of mind. Of course, Dr. Khatri's opinions are technical and
12 relate to technical issues of the case, and Dr. Khatri is
13 eminently qualified to testify about that.

14 And when it comes to the *Omega* patent of that
15 lawnmower issue, it is a slightly complex issue, but I think
16 your Honor hit the nail on the head when you said, you know,
17 it's complicated, the claim is directed to the lawnmower, it
18 has this baffle, but it also has an on-off switch. That's the
19 key difference here.

10:44AM 20 It's not like the Court in the lawnmower case looked
21 at the claim that had an on-off switch and said, ugh, but
22 that's conventional because some IPR some time found it
23 invalid. It simply wasn't in the claim. The claim only talked
24 about a lawnmower --

25 THE COURT: My point, and maybe it's a silly and

1 obvious one is let's say you had a patent with five claims,
2 water, sand, cement, gravel and concrete. The IPR is like, no,
3 you don't get to patent water, sand, gravel, so the first four
4 claims are out, but even though they're all conventional, your
5 combination is patentable and the improvement is all those
6 things put together.

7 Now, Google says Khatri didn't opine on the
8 combination, and maybe that's a separate issue, but the
9 conventionality of the component itself is what it is. I mean,
10:45AM 10 it doesn't mean that it can't be part of something that is
11 itself improvement.

12 MR. SEEVE: That's exactly right, your Honor.

13 THE COURT: All right. Anything else you want to take
14 up, and I suppose if need be, we can postpone this by video,
15 although I would like to sort of get moving on all of this. Is
16 there something else that -- I've let Google set the agenda
17 here. Yes.

18 MR. TIMBERS: Yes, your Honor, I know your time is
19 very short, so I'd like to take two minutes on the Section 101
10:46AM 20 issue, which is cross-motions.

21 THE COURT: Yes.

22 MR. TIMBERS: One thing I really want to emphasize is
23 Step 2, Google has the burden of proof on this defense to prove
24 well-understood, routinely conventional by clear and convincing
25 evidence.

1 Google has not proven it by any evidence, and I would
2 point your Honor to the two-page, sorry, four-page, if you
3 count the top, the four-page statement of facts that Google has
4 applied in their motion. They do not address well-understood,
5 routine, and conventional either in their motion or in response
6 to ours. They have the duty to do so, and I want to clarify
7 something that's very important.

8 Just because something is in the prior art does not
9 make it well understood, routine and conventional. *Berkheimer*
10 makes this very, very clear. It says, "Whether a particular
11 technology is a well-understood, routine and conventional goes
12 beyond what was simply known in the prior art." This is a
13 question of fact. They have to prove it, and if you look at
14 the citation to their expert's report, he does not say the
15 ordered combination is well understood, routine and
16 conventional. Instead, he just says it's not a technological
17 innovation. That's not what they have to prove. They have to
18 prove that the absence of that evidence here at the summary
19 judgment stage means that their motion has to be denied and
20 Singular's motion has to be granted. Thank you.

21 THE COURT: Mr. Van Nest, do you want to respond?

22 MR. VAN NEST: I'll respond very briefly, your Honor,
23 and thanks again for your patience this morning and for your
24 accommodation on our schedules. We appreciate that.

25 The only thing really left to debate as you've heard

1 on this issue is whether the exceeds limitation, which is all
2 that's left of inventiveness after the PTAB ruling is anything
3 other than conventional and well understood, and as we pointed
4 out in our brief, both our opposition to their motion, which
5 their motion didn't address Section 2, it just addressed
6 Section 1.

7 Our motion addressed both, but our motion points out
8 that mixing different precision units was well known in the
9 art, as their patent concedes. In the '273 patent at column 5,
10:48AM 10 lines 31 to 33, they admit that mixing precision units, i.e.,
11 higher precision and lower precision was well known in the art
12 and was used in pyrographic processors.

13 They didn't dispute that. They didn't dispute that in
14 their opposition. Dr. Khatri doesn't have an opinion that the
15 exceeds level is anything other than arbitrary, only opinions
16 that the claims as a whole are unconventional.

17 So they concede also that this exceeds limitation
18 covers a vast range of different things. None of them are
19 unconventional. None of them are new. They don't provide any
10:49AM 20 evidence from Dr. Khatri or anywhere else that there's anything
21 unconventional because they concede in the patent itself, in
22 the file history, in the patent that mixing precision support,
23 having a device with both higher and lower precision was well
24 known and used in pyrographic processors.

25 And the idea that 100 is anything other than an

1 arbitrary number isn't supported anywhere either. There's no
2 opinion by anyone that that number is significant or inventive
3 or meaningful in any way, shape or form. It is a requirement,
4 as I pointed out at the top of the hour, it is a requirement of
5 the limitation, but it doesn't add anything to the abstract
6 idea, and it's not unconventional in the least, so those are
7 the issues that we wanted to call your Honor's attention to
8 this morning, and, again, we appreciate your time and
9 attention.

10:50AM 10 MR. DOHERTY: Your Honor, does your Honor have one
11 more minute just so I can address the motion to exclude certain
12 testimony of Ms. Stamm and Dr. Walker? I'll keep this very
13 brief. We asked in the contention interrogatory for Google to
14 identify non-infringing alternatives it contends exist, and
15 they identified GPUs, they identified CPUs, they identified a
16 host of other things, which are consistent with their document
17 production. Those are the things they analyzed and tested.

18 They then have a catch-all that identifies alternative
19 number formats, quote, "an exponent of 8 bits, a sign bit, and
10:51AM 20 a fraction of up to 15 bits," and then they conclude that
21 paragraph by saying, "or any other format." That's a
22 catch-all. It doesn't identify a single specific format. It's
23 15 different combinations, and we now know from Dr. Walker,
24 their own technical expert, that 10 of those 15 actually
25 infringe, so it's not up to -- it's not on Singular to try to

1 figure out what Google's contention is. They have to tell us.
2 They didn't. It was never disclosed until after our expert
3 reports were served, and they served their rebuttal reports,
4 and the prejudice can't be overstated, it can't be overcome.
5 We've got no fact discovery on bf20, as they call it, and it
6 should be excluded. Thank you.

7 MR. VAN NEST: Your Honor, Ms. Shah is going to deal
8 with that.

9 THE COURT: All right.

10:51AM 10 MS. SHAH: Good morning, your Honor. I have a
11 slightly longer presentation that I won't give, I'll just
12 respond to it briefly, but I can give the slides to the clerks
13 afterwards, if it's helpful.

14 THE COURT: And me, too.

15 MS. SHAH: And you, your Honor.

16 THE COURT: Not just the clerks.

17 MS. SHAH: With regard to whether this was disclosed
18 or not, your Honor, Google's interrogatory response did
19 disclose what its experts now refer to as bfloat20. For people
10:52AM 20 who are skilled in the art, referring to these number formats
21 by the number of bits is how they do that, and that's exactly
22 what Google disclosed. It wasn't 15 separate number formats.
23 What Google said was "non-infringing number formats with up to
24 15 bits," and that's exactly how Singular's own patents
25 describe these ranges. They give a range, and that's exactly

1 why Google responded in that way.

2 Singular's interrogatory asked for any acceptable
3 non-infringing alternatives, and that's why Google provided a
4 list, a range of those acceptable non-infringing alternatives.
5 And now for them two years later to claim that they didn't have
6 enough information when there was no prejudice during the fact
7 discovery, they had the opportunity to ask further questions,
8 they could have moved to compel, they could have sought more
9 information, and they did none of that.

10:53AM 10 The *Steady* state case says that, "when you do nothing
11 to alleviate the prejudice, then at this point claiming
12 prejudice cannot be something that weighs in favor of
13 preclusion," which is a very weighty sanction, and so for that
14 reason, that was disclosed, your Honor, and if there was an
15 issue about the sufficiency of the disclosure, it was two years
16 too late to make that argument. It was in Google's
17 interrogatory response, and I'm happy to provide more
18 information. We'll rest on our briefs otherwise though.

19 THE COURT: All right. Do you want to hand that up?

10:53AM 20 MS. SHAH: Yes, your Honor.

21 THE COURT: Let's talk about where we go from here.
22 First I want to set another conference, ballpark three weeks
23 out.

24 THE CLERK: Tuesday, July 18th at 3:30.

25 THE COURT: Tuesday, July 18th, 3:30 eastern time by

1 video, or we can do it hybrid if people want to show up. If I
2 deny the motion to move the trial, and I'm not expressing an
3 opinion, I haven't made that decision yet, but let's assume the
4 trial date holds means I need to resolve all of these, and,
5 obviously, not the Friday before we impanel a jury, and so I'm
6 not quite sure what I'm going to do.

7 I expect that some of these rulings are going to be
8 less than model opinions. They may even be delivered orally or
9 I will issue electronic orders. I have to do a triage here and
10:54AM 10 figure out what I'm going to do and in what order and in what
11 level of detail, but I guess I'm apologizing in advance. This
12 may be something less than an opinion that will be quoted for
13 millennia to come, but I'll see. I have a lot of work to do in
14 a short period of time, and we'll see where we are in three
15 weeks. It's possible I may render some or all of those
16 decisions orally at that conference. I need to just figure out
17 what I need to do going forward.

18 And I recognize, obviously, people have summer
19 schedules, even patent lawyers, I think, take vacations, so I
10:55AM 20 understand that there's a lot to do in the time we have
21 remaining, but that's where things are as they stand, but I
22 will take all of this under advisement, including the motions
23 that were not argued.

24 I'm certainly not going to assume because you didn't
25 argue something you've waived it, that is, you didn't orally

1 argue it, and I recognize that some of these issues were
2 perhaps given short shrift in light of the time allotted, but
3 I'll take it under advisement. All right. Anything further,
4 Mr. Van Nest?

5 MR. VAN NEST: Your Honor, just to clarify, we will be
6 together on Zoom on July 18th at 3:30 eastern?

7 THE COURT: Yes.

8 MR. VAN NEST: That's fine, thank you.

9 THE COURT: Again, if some or all of you want to
10:56AM 10 appear in person, we can do it in hybrid. I don't care, to be
11 honest.

12 MR. SEEVE: I think since it's a CMC, we're happy to
13 do it over Zoom, as we've been doing it. It saves time and
14 money and travel for everybody.

15 THE COURT: And people ask me this question all the
16 time. It literally makes no difference to me. Maybe something
17 is wrong with me, but I don't care if we do it by video or
18 live.

19 MR. SEEVE: I think it's been working well. Thank
10:56AM 20 you.

21 MR. TIMBERS: Your Honor, just one other thing. The
22 parties are trying to work on a pretrial exchange schedule.

23 THE COURT: Okay.

24 MR. TIMBERS: I'm hopeful that we'll work that out.

25 THE COURT: Okay.

1 MR. TIMBERS: But if we don't, we'd want to come to
2 you immediately to see if we need any help on that. I just
3 wanted to raise that.

4 THE COURT: Okay. As you're thinking about the trial,
5 again, you're experienced. I don't need to tell you how to do
6 your jobs, but get out your scalpel and your machete, your
7 chain saw, your excavating equipment, whatever it is you need
8 to cut this down to what really matters, what is important, and
9 what these poor lay jurors are going to understand.

10:57AM 10 All right. With that, we'll stand in recess. Thank
11 you. It was well argued on both sides.

12 (Whereupon, the hearing was adjourned at 10:57 a.m.)

13 C E R T I F I C A T E

14 UNITED STATES DISTRICT COURT)
15 DISTRICT OF MASSACHUSETTS) ss.
16 CITY OF BOSTON)

17 I do hereby certify that the foregoing transcript,
18 Pages 1 through 74 inclusive, was recorded by me
19 stenographically at the time and place aforesaid in Civil
20 Action No. 19-12551 -FDS, SINGULAR COMPUTING LLC vs. GOOGLE LLC
21 and thereafter by me reduced to typewriting and is a true and
22 accurate record of the proceedings.

23 Dated July 5, 2023.

24 s/s Valerie A. O'Hara

25

VALERIE A. O'HARA
OFFICIAL COURT REPORTER